Arizona July 1, 2013 Population Estimates – Methodology

COUNTY ESTIMATES

The county-level estimates (county controls) are developed using a Composite Method which relies on several sources of administrative data for four age groups: births and deaths for ages 0-4, school enrollment for ages 5-17, driver's licenses and ID cards for ages 18-64, and Medicare and Social Security enrollments for ages 65+. In general, we create a ratio of the census population in each age group to the population indicated by administrative records for the census date. This ratio, called Censal Ratio, is applied to the administrative data for the reference date of July 1 of the estimate year. The independent population estimates for each age group are added together to obtain the county's total population. The Group Quarters (GQ) population is then subtracted to produce a household population control for each county.

GQ population is estimated in the following steps:

1. Establish the total GQ population in each place (incorporated place or unincorporated balance of county) as of Census 2010 (taking Count Question Resolution into consideration);
2. Track the GQ population of major facilities annually;
3. Find the change in GQ population in these facilities between Census 2010 and estimate year;
4. Estimate total GQ population of each place by adding numbers from Step 1 and Step 3.

SUB-COUNTY ESTIMATES

Estimates for incorporated places and unincorporated balances of county are produced using the controlled housing unit method (HUM). The following steps are executed:

1. Use the latest Count Question Resolution results to update Census 2010 housing units, occupancy rates, persons per household, household population and Group Quarters population for each jurisdiction.
2. Determine the July 1, 2013 housing unit stock by adding new completions and building permits to the July 1, 2012 housing stock. For permits, a six-month lag is assumed for single-family units and 2-4 units; a 12-month lag is assumed for 5-plus-unit buildings. It is assumed that 98% of permits are built. Mobile homes are assumed to be in place the same quarter they are permitted with a 100% placement rate.
3. Pre-annexation household population is calculated by multiplying the new housing unit stock by census occupancy rate and persons per household.

4. For annexations that contain housing units, the actual number of occupants is determined from field information. If that is not possible, census block-level occupancy rate and persons per household are used. When block-level data is unavailable, the annexing jurisdiction's census occupancy rate and persons per household information is used. The corresponding number of persons is then subtracted from the jurisdiction that deannexed the housing units.
5. Adding up the numbers from steps 3 and 4 results in the uncontrolled household population for each jurisdiction; this is summed up at the county level.
6. The county's HUM household population is then divided into the household population control obtained from the composite method to yield a "control factor" for each county.
7. The control factor is applied to (multiplied by) the HUM household population estimate of each jurisdiction to get the "controlled" household population estimate.
8. Sub-county estimates are then finalized by adding the GQ population back in at the jurisdiction level.

SPECIAL ADJUSTMENTS

Group Quarters Adjustment

Adjustment to the composite total is necessary due to some large changes to GQ population in adult correctional facilities in several counties (Cochise, Graham, Mohave, Pima, Pinal, and Yuma). The driver's licenses data used in the composite method do not pick up these changes. We contacted the Department of Corrections which confirmed that the status of a driver's license is not changed when someone is committed to prison (except for offenses that require the revocation of the license). For example, suppose someone is convicted in County A and is sent to prison in County B. The inmate is not likely to change the address from County A to County B with MVD. The composite method will likely overestimate the total population in County A and underestimate the total population in County B.

The following steps are taken to make the adjustment:

1. Using Arizona Department of Corrections' County of Conviction data, compute the total number of convictions from each county between April 1, 2010 (Census 2010) and June 30, 2013.
2. Compute the respective proportions for each county by dividing the total for the county by the total for Arizona.
3. Apply the expected proportions from Step 2 above to the number of new inmates (from the GQ data) to obtain the expected number of new inmates between Census day (April 1, 2010) and July 1, 2013 for each county.
4. Subtract the expected numbers from Step 3 above from the actual number of inmates to get the adjustment for that county.

5. Add the adjustments from Step 4 to the County Controls from the Composite Method to obtain the Adjusted Country Controls.

0-4 Age Group Censal Ratio Adjustment

The original censal ratio method may have produced population estimates for the 0-4 age group that are too low. The censal ratio was calculated using the births and deaths between 4/1/2005 and 3/31/2010 and the enumerated population on 4/1/2010. The resulting censal ratio reflected net migration that occurred during the period of 4/1/2005 to 3/31/2010. Because this five year period was likely dominated by outmigration in the later part, the censal ratio for the state amounted to 0.934, or a 6.6% outmigration rate. Most counties experienced outmigration (except for Graham, Greenlee, and Pinal). This magnitude of outmigration, and perhaps the direction of net migration, is likely not accurate for the present year (or the past three years).

In the adjusted method, different censal ratios are applied to two groups of children who were born and survived within the last five years. For the group born between 7/1/2008 and 6/30/2010, we assume that the experience of outmigration is true and apply the original censal ratios to the input data. For the group born between 7/1/2010 and 6/30/2013, we assume that 0 net migration took place and use a censal ratio of 1. We make this assumption because any positive migration that may have occurred was likely low. This logic is applied to all counties except for Graham and Greenlee, where we believe that the positive net migration is reasonable due to continued economic growth. Pinal had a censal ratio much greater than 1. However, there is no evidence that large-scale in-migration continued in the past three years. Therefore, the same assumption is made for Pinal as for the other 12 counties.

Greenlee Adjustments

Due to the reopening and expansion of the Freeport-McMoRan Gold and Copper (FMI) mine, there is overwhelming evidence that Greenlee County has experienced rapid population growth in the past couple of years. However, the composite method does not adequately capture this rapid growth. We decide not to use the composite method for Greenlee, but instead rely on other methods – HUM in the case of the Clifton and Morenci, and HUM plus electric accounts in the case of Duncan.

The following steps are taken to determine the resident population of the Town of Clifton and Morenci CDP (in the Balance of Greenlee County).

1. Using data submitted to ADOA by SEAGO and FMI, we estimate the FMI property's current occupancy rate to be about 97% and its persons per household (PPH) to be 3.01.
2. Using 2010 Census data, we compute the number of vacant housing units available for occupation as

Total Number of Vacant Housing Units - Seasonal Housing Units

Given the current situation at the FMI mine, we assume that the computed HUs above have about a 97% occupancy rate with an average of 3.01 occupants (from Step 1).

3. From the Building Permits/Completions data submitted to ADOA by SEAGO, 244 new housing units have been added to the FMI properties in the 1.5 year prior to July 1, 2013. Of those, 20 are in the Town of Clifton and the rest in Morenci CDP.
4. Add the numbers from Step 3 to the numbers from Step 2 to obtain the total number of previously vacant housing units and new housing units available for occupation.
5. Apply the occupancy rate and PPH computed in Step 1 to the numbers in Step 4 for the respective places to obtain the new resident population.
6. Add the new resident population of Morenci CDP to the 2013 Population Estimate for Balance of Greenlee County. Similarly, add the new resident population of Clifton to the 2013 Population Estimate for Clifton.

For Duncan, the following steps are followed:

1. Using data provided by the Duncan Valley Electric Cooperative (DVEC), determine the number of active single-metered accounts that have an average monthly energy consumption of at least 100 kWh.
2. From the street drive conducted by personnel from City of Duncan, Greenlee County, SEAGO, and ADOA, estimate the number of RVs, mobile homes, and trailers that do not have their own electric meters (hooked up to housing units or as part of a master-metered RV/trailer park).
3. Add the numbers from steps 1 and 2 together to estimate the total number of occupied units.
4. Obtain the 2010 Census persons per household for Duncan.
5. Apply the persons per household from Step 4 to the number in Step 3 to obtain the 2013 population estimate of the Town of Duncan.

ADOA adopted the population estimates produced by Maricopa Association of Governments (MAG) for places within Maricopa County. MAG applied a slight variation of the HUM method to distribute the ADOA Adjusted County Control to its member jurisdictions. The methodology can be referenced at http://www.azstats.gov/pubs/demography/MAG_Method2013.pdf.